
I. GETTING STARTED

Requirements

HM modules¹

- Line Converter (INPUT22.XLS)
- Wire Center (WCINV22.XLS).
- Convergence (CONV22FCC.XLS)
- Expense (EXP22FCC.XLS)

BCM modules²

- Datamaster
- Loop

Inputs

- Raw Data (NVDTIN1.XLS, etc.)
- Line Totals file
- LERG data (switch, tandem and stp locations)
- DEM & Call totals by company
- Formatted ARMIS financial data (PTNV.WK3, etc.)
- Debt/equity figures for company - Annual Report or source

The Hatfield Model (HM) consists of four modules³: Line Converter, Wire Center, Convergence, and Expense. The Wire Center module uses inputs from the Benchmark Cost Model (BCM), but the BCM is not part of the HM, and must be purchased separately. All other inputs for the Hatfield model are publicly available. In addition, these instructions assume general Excel skills on the part of the user.

Directory Structure

These instructions will assume a basic directory structure as follows:

The main model directory (C:\HATFIELD COSTING MODEL) should contain three folders or subdirectories: HM -- VERSION 2.2, DATA, and OUTPUT⁴. The HM -- VERSION 2.2 subdirectory should contain all BCM and HM modules⁵.

Before running the automated BCM and HM models, make sure that your module names match those in the "Module Filenames" sheet of the automated workfile. The file names may be changed as necessary, as long as the directory structure is reflected in the "Module Filenames" sheet of the automated workfile. The file and directory names in this sheet may be changed by the user at any time.

¹ All references to the Hatfield Model (HM) refer to the four modules filed with the FCC on June 21, 1996.

² All references to BCM refer to the Benchmark Cost Model, Version 1, filed on September 12, 1995. Raw data for all 50 states was filed on December 1, 1995.

³ These instructions will refer to the HM modules by these names.

⁴ These instructions will italicize file names and capitalize directory or subdirectory names. Sheet names will be marked with quotation marks. For example: HM -- VERSION 2.2 *workfile.xls* "Raw Data" denotes the sheet named "Raw Data" in the workfile file, found in the HM -- VERSION 2.2 subdirectory.

⁵ The names of these files may vary.

The HM -- VERSION 2.2 subdirectory should also contain the automated version of the workfile template, *template.xls*.

The DATA subdirectory should contain all original data files including raw data, LERG data, ARMIS reports and DEM and call totals.

The OUTPUT subdirectory is used to store both partially and fully completed workfiles.

II. Running the Automated BCM and HM

Populating the workfile

Your new workfile must be populated with the raw data necessary to run both the BCM and the HM. Any changes made to this data should be made to the data in the workfile, not to the original data.

1. Open the automated version of the workfile template, *template.xls*, in the HM -- VERSION 2.2 subdirectory.
2. Save the workfile into the OUTPUT directory, using a name that reflects its contents, such as PTNVout.xls (output for Nevada). If you try to run the model without saving the workfile with a new name, the model will prompt you to do so.
3. Raw Data - From the DATA subdirectory, open the raw data file for the state you wish to analyze. Sort the raw data by company. Copy columns A-N of the rows that contain data for the company you wish to analyze into the workfile "Raw Data" sheet.
4. LERG Data - From the DATA subdirectory, open the file containing the wire center/LERG data for the company you are analyzing (for ICOs use independent wire center data). Copy and paste the wire center information into the workfile "Switch Loc" sheet.
5. STP and Tandem locations. These are located just below the LERG data in the same file, and should be copied and pasted into the appropriate boxes in the workfile "inputs" sheet.
6. ARMIS Data - From the DATA subdirectory, open the file containing the ARMIS expense/revenue data for the company you are analyzing. The center of the top of the sheet should show the company name as the code for the company being analyzed (e.g. SBGA for Bell South - Georgia). If the upper-left corner of the first sheet is marked "Transformed", the file is ready to use. Copy the entire sheet to the workfile "ARMIS" sheet. If the data is not transformed, the automated module will transform it, and it can be pasted into the workfile as-is.
7. Close all files except the workfile. You have now populated your workfile, and you are ready to run the BCM and the HM.

Line Converter

1. Under the "Tools" menu, choose "HM Control Panel".
2. Move control panel to the bottom half of the screen, and click the Line Converter button. Choose "yes" when prompted to open the file as "read-only". The line converter module will calculate in 5-10 minutes, and will notify you when it is finished. When finished, the "percentage difference" in the line converter table will be less than .05% in each density range.
3. Close the Line Multiplier module without saving changes.

Datamaster module

1. Under the "Tools" menu, choose "HM Control Panel".
2. Click on the Datamaster button. Choose "yes" when prompted to open the file as "read-only". The Datamaster module will calculate in 1-5 minutes, depending on the number of records, and will notify you when it is finished.
3. If you have soil type errors, follow the instructions in the "troubleshooting" section to correct them.
4. After all soil type errors are corrected, copy the surface texture column (column M) from the "Data&Calcs" sheet to the surface texture column (column M) in the workfile "Line Converter" sheet.
5. Close the Datamaster module without saving changes and start the automated Datamaster again from step 1.
6. If there are no errors, close the Datamaster module without saving changes.

Loopmaster module

1. Under the "Tools" menu, choose "HM Control Panel".
2. Click on the Loopmaster button. Choose "yes" when prompted to open the file as "read-only". The Loopmaster module will calculate in 3-10 minutes, depending on the number of records, and will notify you when it is finished.
3. Close the Loopmaster without saving changes.

Wire Center module

1. Under the "Tools" menu, choose "HM Control Panel".
2. Click on the Wire Center button. Choose "yes" when prompted to open the file as "read-only". The Wire Center module will calculate in 3-8 minutes, depending on the number of records, and will notify you when it is finished.
3. If you have Wire Center errors, follow the instructions in the "troubleshooting" section to correct them.
4. After all errors are corrected, close the Wire Center module without saving changes and start the automated Wire Center again from step 1.
5. If there are no errors, close the Wire Center module without saving changes.

Convergence module

1. Under the "Tools" menu, choose "HM Control Panel".
2. Click on the Convergence button. Choose "yes" when prompted to open the file as "read-only". The Convergence module will open in 10-20 minutes and will calculate in 2-5 minutes, depending on the number of records.
3. Close the Convergence module without saving changes.

Expense module

1. Under the "Tools" menu, choose "HM Control Panel".
2. Click on the Expense button. Choose "yes" when prompted to open the file as "read-only". The Expense module will calculate almost immediately.
3. Save the Expense module in the OUTPUT directory, with a name that reflects its contents, such as ExpGA.xls
4. Save and close your workfile and exit Excel.

IV. Troubleshooting Tips

As a rule of thumb, whenever a “#N/A” value is in any of the cells there is a reference problem. Excel returns ‘#N/A’s’ whenever a formula is looking for a certain reference which is not present in the locations given in the formula. In such situations, either a new reference must be given, or the missing reference must be incorporated in the model.

LINE CONVERTERS

1. Before you start, make sure that you are only calculating multipliers for the company you are studying. For example, if you are doing RBOC runs, make sure that your data set does not include CLLIs served by other companies.
2. Make sure that the ARMIS data you are using is relevant for the companies you are running. Again, if you are running an RBOC, you will only need RBOC access lines. When you run the entire state, you should sum the access lines of all companies in that state. Only sizable companies (RBOC, GTE, etc.) report access line to ARMIS. If you need to run an ICO, you will first need to identify the access lines in that state.
3. The percent difference that is calculated must be within the ± 0.5% range. If the difference is not within this range after the initial calculations and iteration run, check the input data (ARMIS and raw data) to make sure that you are using the correct data set. Manually adjust the values within the Line Converter table to obtain values which places the percent difference in the acceptable range (search for the columns where the line fraction category’s percent difference is out of range and adjust these numbers). Press the F9 key to recalculate the overall multiplier and percent difference. If the percent difference is still not within range continue adjusting until the desired results are achieved.
4. Multiplier fractions should always increase with density range, therefore they should appear in ascending order in the Line Converter table. If not, adjust the numbers accordingly. Then recalculate to ensure that the percent difference is still within range. If it is not, follow the instructions in step 3.
5. Access lines either exist or do not exist, therefore, Line Converters must always be positive. Any negative value should be replaced by at least a value of zero or greater in the Line Converter table. If not corrected, you will notice a problem by obtaining negative costs in later modules. After replacing the negative value, recalculate and adjust as described in previous steps.

DATAMASTER MODULE

If you find '#N/A' on the "Output" sheet of the Datamaster Module, the problem is often due to soil type reference errors. The Joint Sponsors compiled the Soil Type information found on the "Tables" sheet. The U.S. Geology Survey subsequently changed the nomenclature for some soil types. As a result, the soil types included in the Soil Type Table can either be misspelled or not be included at all. The Soil Type Table provides only two indicators: a "1" indicates that the terrain type will have an impact on placement costs, and a "0" indicates that the terrain type will have no impact on placement costs. Furthermore, the letters before the "-" indicate the major soil type and the letters after the "-" indicate variations on these soils.

1. To correct an '#N/A' problem proceed as follows:
 - Go to column Y of the "Data & Calcs" sheet
 - Search each row until you find a '#N/A'
 - Look for the surface texture designation in column M in the same row where the '#N/A' appears
 - Go to the Surface Texture Table in the "Tables" sheet
 - Look to see if the texture designation is in the table (it should not be since '#N/A' is in the data)
 - Look for the next closest surface texture type
 - Change the original designation to match the closest type found
 - Recalculate the Data Master (F9) and search for '#N/As'
2. Repeat as necessary until all '#N/As' are gone.
3. Once all soil type errors are corrected, copy column M from Data&Calcs to column M in the Line Converter sheet of the workfile.

LOOPMASTER MODULE

Any “#N/As” in the Loopmaster Module are usually present in the input sheets to the module, i.e., they are mistakes carried over from the output of the Datamaster Module.

1. If you find “#N/As” in the Loopmaster Module output, trace back these “#N/As” to the input sheet. Then retrace these errors to the Datamaster Module’s Troubleshooting Tips section of this manual.
2. Make sure that all the cost numbers are positive. If you have negative costs, it is most likely because the data was not sorted properly before the Loopmaster Module was run. In this case, sort the input data from A-L by *CLLI, Quadrant and B* and re-run the Loopmaster Module.

WIRE CENTER MODULE

Reference errors found in the Wire Center Module will return “#N/As” in the “Distances” or “WireCenterInvestperLine” sheets. To correct these problems, proceed as follows:

1. Investigate the presence of “#N/As” in the various columns in the “Distances” sheet. If found, go to the “LATA mod data in” sheet and click on the first CLLI code (the cursor should begin to blink in the edit window indicating that you are in the edit mode). Make sure that no extra spaces appear in the beginning or end of the character line. If they do, delete the unneeded spaces by using Excel’s “trim” function. Check the other CLLI codes to ensure that no others have this problem. Rerun the module.
2. Go to the STP and tandem tables in the “wc line tots & VH” sheet to determine what LATA numbers are logged in the table. Verify that each CLLI registered in the “LATA mod data in” sheet has a correct LATA number in the “switch location input” sheet as logged in the STP and tandem table. If not, change the LATAs in the “switch location input” sheet accordingly. Rerun the module.

3. Go to the STP and tandem tables in the "wc line tots & VH" sheet. Determine whether the LATA numbers are in consecutive, increasing order. If not, move the LATAs and their corresponding vertical/horizontal coordinates to the proper location in the table. Rerun the module.
4. Often you will find "#N/As" in the V/H columns next to the pivot table on the "wc line tots & VH" sheet. If that is the case, check for the following:
 - In some instances, the CLLI codes in the Wire Center Input sheet are misspelled. Write down the name of the CLLI code that contains an "#N/A" and look for that CLLI code on the "switch location input" sheet, in column A (most often, the 7th and or 8th digit of the CLLI code are the ones misspelled). If that is the case, correct the spelling on the "wire center input" sheet and re-run the module.
 - If there is no CLLI code that is remotely close to the one in question, research the region to find out if the wire center has been sold. If so, remove those CLLIs from your raw data and re-run the model from the beginning (starting with the Line Converters).
 - If the CLLIs in question are from a state other than the one you are running, either remove them or find which LATA is closest to the city (within the state) in question and substitute that in-state LATA number in the LATA column on the "switch location input."
5. Lastly, LATA numbers may actually appear in the "distances" sheet but columns F-H will have "#N/As" in them. Correct this problems by:
 - Determining what the CLLI code is for the row where the '#N/As' appears
 - Finding the same CLLI code in the "switch locations input" sheet
 - Changing the LATA numbers to reflect the correct LATA. It may be incorrect due to a simple typing error. Consult a LATA map to verify the LATA number in question. Also, ensure that the correct LATA is in the STP/Tandem table on the "wc line tots & VH" sheet. Rerun the module.

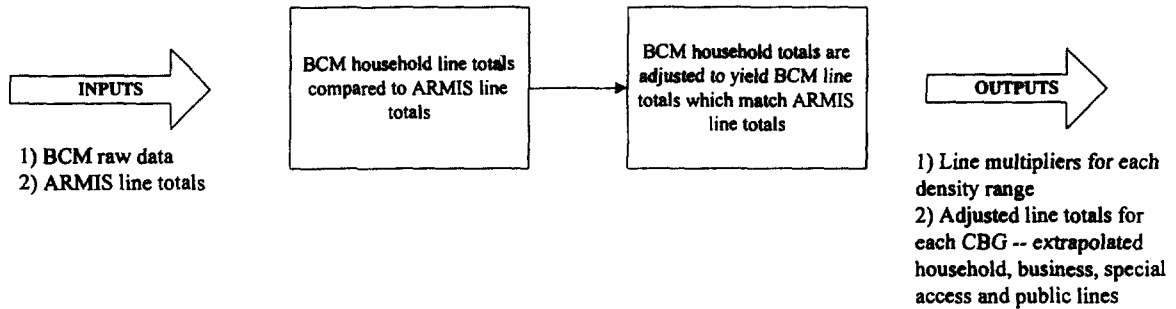
CONVERGENCE MODULE

The Convergence Module has limitation on the number of lines that may be input. The output from the wire center, which is part of the input for the Convergence Module, cannot contain more than 1,500 records. Likewise, the Loopmaster Module's output, which is used as the other part of the Convergence Module input, cannot have over 5,300 records. If any of the line limits are surpassed, the data beyond these limits are not registered, hence the results would be incomplete and erroneous.

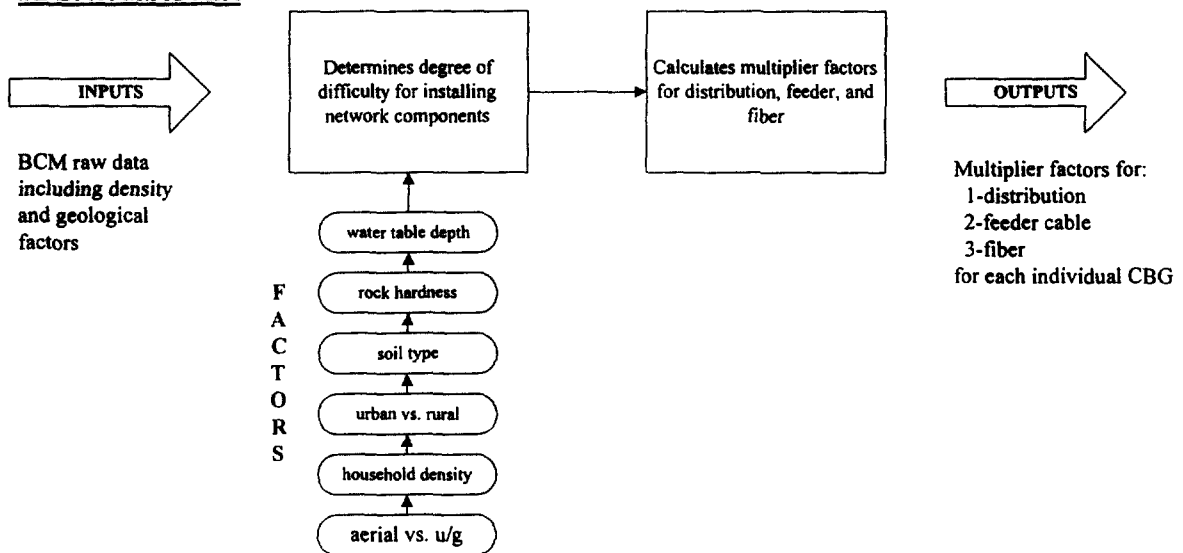
If the previous modules were run correctly and all previous data issues have been successfully resolved, the Convergence Module should only present one type of "#N/A" error. This error only occurs when a state or region lacks lines in a particular density. You may find this error if you run a small independent company that serves a rural area, thus it is more likely that the small company would not serve any customers in the 5,000 density range. The reason that the model would return a "#N/A" error is that the Excel Pivot Table is searching for data in a particular density range and can not find any, generating the error. To correct this problem:

1. Go to the workfile and replace the "#N/A" with a number that approximates zero, e.g. 0.000001 or 1E-200 (If the "#N/As" are not replaced by zero (0), the Expense Module will not run correctly and will return #Div/0!). Then rerun the module.

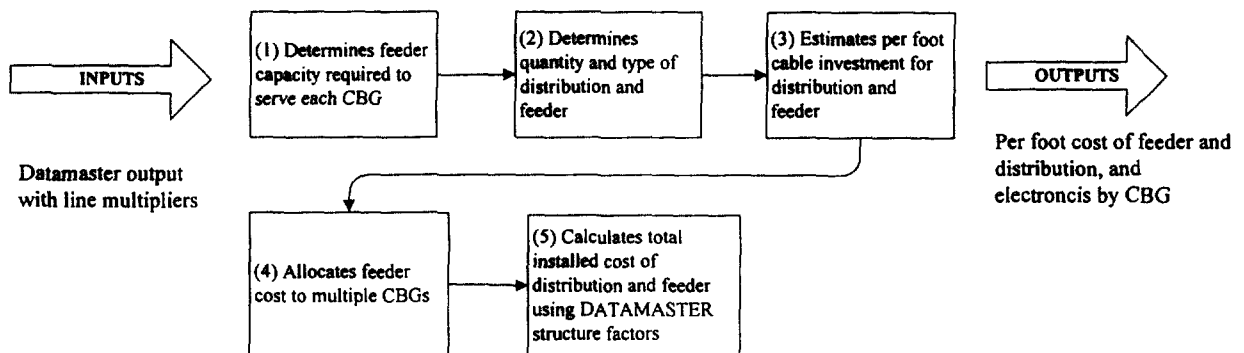
#1 LINE CONVERTER



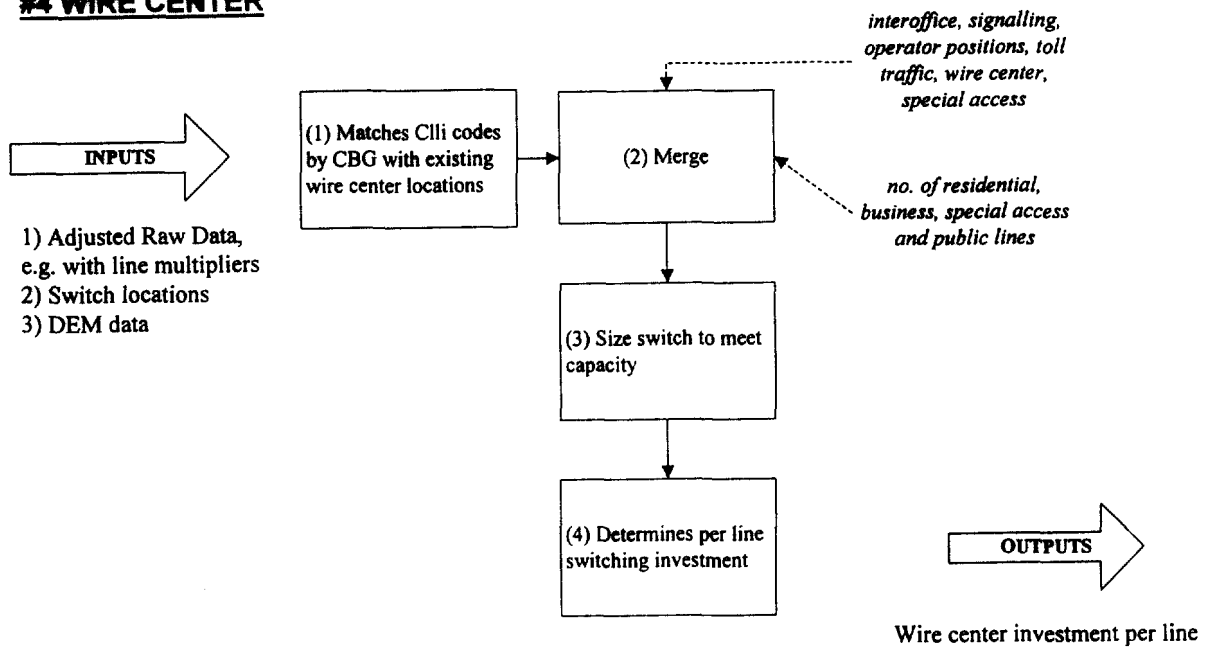
#2 DATAMASTER



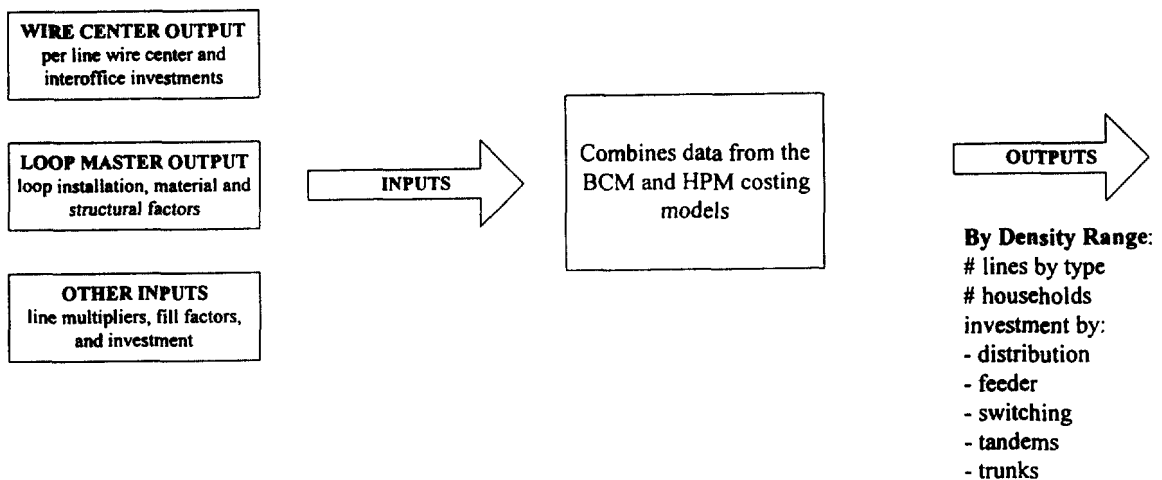
#3 LOOPMASTER



#4 WIRE CENTER



#5 CONVERGENCE



DOCUMENT OFF-LINE

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- o An oversize page or document (such as a map) which was too large to be scanned into the RIPS system.

- o Microfilm, microform, certain photographs or videotape.

- ☒ Other materials which, for one reason or another, could not be scanned into the RIPS system.

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